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aluminium, through which the emanations pass more readily. In all the trials he finds that although the germination is not prevented there is a period of retarded growth in the seedling. The elongation of the root or stem may be temporary or permanent according to the duration of the exposure. In the latter case the injured organ persists indefinitely without disorganization, but further growth of the seedling occurs in the form of secondary members. In the case of *Vicia Faba* such a condition will follow an exposure of only one hour; yet an exposure of fourteen days does not prevent germination. Since the retardation of growth occurs sooner in the root than in the stem of a given seedling, the author favors the explanation offered by other investigators, who have worked on entirely different material, that organs engaged in photosynthesis are more resistant to the emanations. The author's experiments offer no conclusive evidence on this point. Organs of seedlings from seeds exposed to emanations retain geotropic sensibility as long as they are capable of growth, the two capacities being concurrent. The same is true of heliotropic sensibility. His earlier view that radium emits enough luminosity to induce heliotropism, which was questioned by MOLISCH, is maintained. Important as these results are, it seems to the reviewer that their value would be much greater if obtained under standardized conditions.—RAYMOND H. POND.

Anatomy of Matonia.—TANSLEY and LULHAM describe the development and mature anatomical structure of a number of specimens of *Matonia pectinata* gathered by one of them on Mount Ophir in the Malay Peninsula.¹¹ The cotyledons in this species are bilobed as in the polypodiaceous ferns. Below the first leaf the central cylinder of the young stem consists of a rod of xylem, surrounded by parenchyma alone; later phloem appears on the outside of the stele and in the center as well. Subsequently the endodermis and "ground tissue" likewise appear within the stele, which becomes typically siphonostelic. By a process of "local dilatation of the margin of the leaf gaps" an internal mass of fibrovascular tissue appears, which ultimately becomes tubular and lies within the original fibrovascular tube. This inner tubular fibrovascular bundle subsequently gives off an internal tracheary strand, which may also become tubular, so that there may be in *Matonia* as many as three tubular bundles lying one within the other. These join each other only in the region of the nodes. The authors consider the internal fibrovascular system as a storage tissue only, since it has no direct connection with the roots, which are attached to the external cylinder, as in other ferns of this type. The views as to the morphological nature of the complex fibrovascular system of the stem in this species may be regarded as "orthodox," since the conclusion is reached that it constitutes a single stele. The hypothesis that the pith is intruded cortex is accordingly rejected, since the authors are of the opinion that the only trustworthy criterion as to the morphological value of tissues is to be derived from a study of their relation to the primary meristems of the growing point.—E. C. JEFFREY.

¹¹TANSLEY, A. G., and LULHAM, Miss R. B. J., A study of the vascular system of *Matonia pectinata*. Annals of Botany 19:476-519. pls. 31-33. 1905.